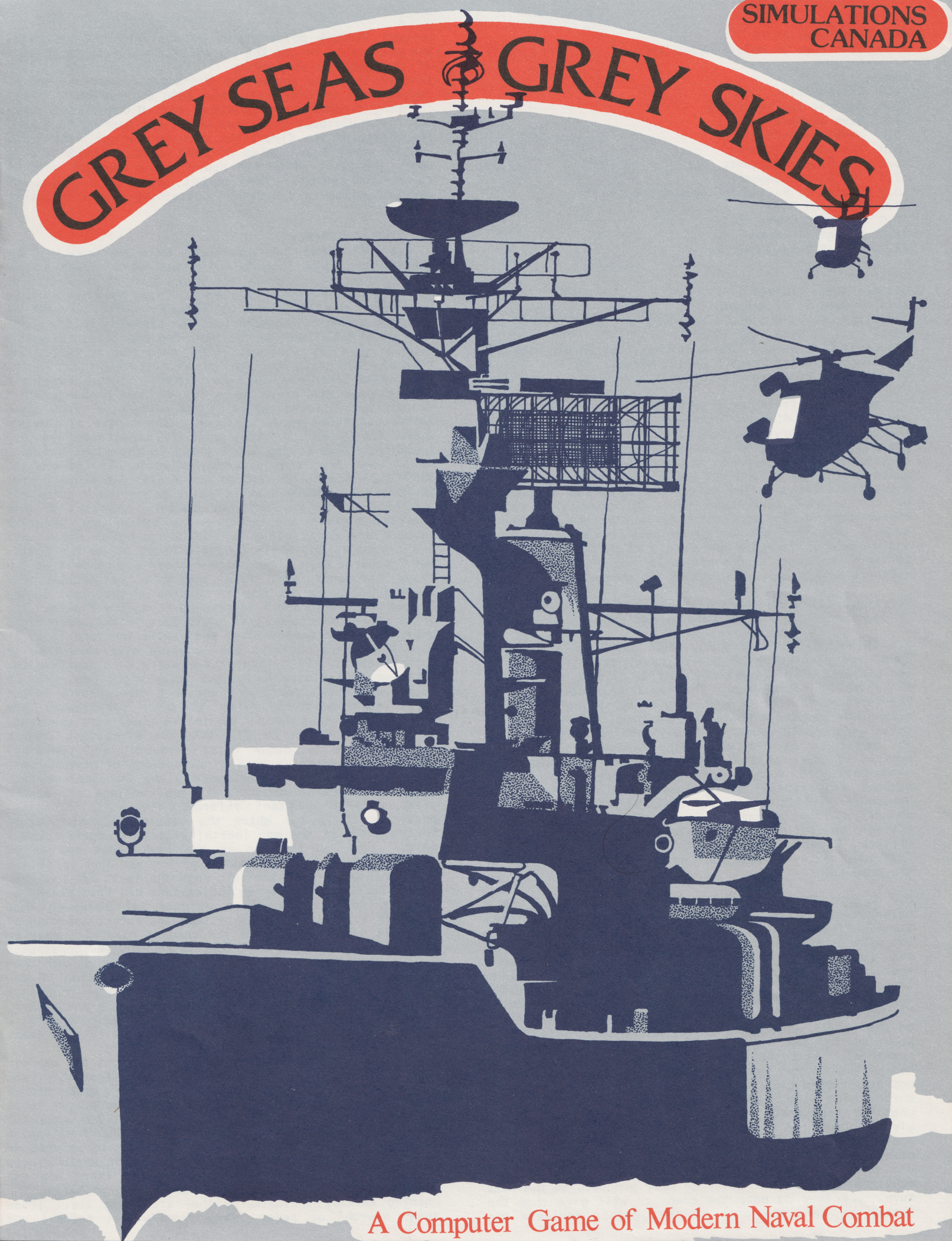


SIMULATIONS
CANADA

GREY SEAS GREY SKIES



A Computer Game of Modern Naval Combat

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1.0 INTRODUCTION: GREY SEAS, GREY SKIES is a detailed game type simulation of modern naval combat for one or two players. The players may control up to a total of 10 ships and/or submarines. They will be responsible for the tactical control of each ship or submarine as well as having the resulting operational control of the group of units under their command. The viewpoint of the players is thus that of the commanding officers or tactical control officers of their units. Elements pertinent to these positions, such as search modes & results, target & weapons selection, conning [movement] instructions, & helicopter [helo] vectoring will be under the direct control of the players. Other operations that these officers would not deal with directly, such as air strikes & defence, zone & solution plotting, and individual helo actions, will be handled automatically by the computer.

2.0 GENERAL COURSE OF PLAY: The game is composed of 2 major sections, the start up of the game and the game itself. The start up allows the players to select their own passwords so that only they can play their portion of the game. Start up also lets the players choose a scenario to be played or construct their own scenario. The game itself is played in turns and follows a constant sequence of play composed of 4 segments for each turn. In the first segment the computer conducts searches based on the orders of the previous turn [or the start orders provided by the computer for a first turn of any scenario]. Next the player segments occur. The player designated Orange is first in this segment and should secretly obtain his search results and give orders to his units. The Blue player is next and should then do the same for his units. After both players have completed giving orders the third segment will begin. This is the combat segment and the computer will resolve any ordered combats and display the results. The final section is an end turn segment that asks the players if they wish to continue the game. If they do play proceeds to the next turn. If they do not, the computer will give them the chance to save the game at that point, indicate the

current victory point status of the players, and allow the players to review the status of the forces at the end of the game by responding 'Y' to that question. Each turn of the game represents 6 minutes. Bearings are in degrees and to true reference [360 degrees to a circle counting clockwise and oriented with 0 degrees at North for the individual unit from which the bearing is taken, regardless of the direct the unit is moving]. Distances are in yards & multiples of 1000 yards. Speeds are in knots [nautical miles per hour] and a nautical mile is about 2000 yards. The combat area is a square 90 nautical miles on a side and containing over 8000 square miles.

3.0 GAME EQUIPMENT:

3.1 THE MAPS: Two identical maps representing the playing area are included with the game. Each player should take one of these and place them so they will be out of sight of the other player. These maps can be used to record the locations of friendly units as well as possible contacts and locations for opposing units.

3.11 LOCATIONS ON THE MAP: The maps are divided up into a grid of squares. The grid has a left-right [termed 'X'] axis and an up-down [termed 'Y'] axis. These axis lines are the heavy central lines. Locations in the game are given as a set of two numbers, an X coordinate followed by a Y coordinate. Each line represents 10000 yards distance. The center of the map where the X and Y lines meet is considered the 0,0 location. Thus moving 35000 yards to the right but none up or down from the center point would put location at 35000,0. This is located on the X axis 3.5 squares from the center. -35000,0 would still be on the X axis, but 3.5 squares to the left of center. On the Y axis positive numbers are up from the center and negative numbers are down. Thus 0,70000 would be on the Y axis and 7 squares up, while 0,-70000 would be on the Y axis but 7 squares down. When both numbers are other than 0 a cross reference away from the axis is made. For 35000,70000 trace out the 3.5 squares on the right of the X axis and then trace 7 squares up along the Y axis. The point where these two lines would meet in the upper right quarter [called quadrant] of the map is the location. If both X & Y are positive the location will always be in this quadrant. If X is positive while Y is negative the location will always be in the lower right quadrant. A negative X with a positive Y will put the location in the upper left quadrant while if both coordinates are negative the location will be in the lower left quadrant.

3.12 BEARINGS ON THE MAP: The directions from a friendly unit to other units [friendly and opposing] detected in search as well as directions of movement are given in bearings. Bearings are the 360 degrees into which a circle is divided. These bearings are always given from a constant reference to north from the particular unit for which the bearing is being used. Thus the top of the map [north] will be 0 degrees from a unit. East on the map is the right edge and is 90 degrees. South is the bottom of the map and is at 180 degrees. West is on the left edge and is at 270 degrees. A compass rose with degree indications has been placed on the map to indicate these points, but remember that bearings will always be taken from the actual location of the unit involved. Hence the compass rose will only be exactly correct for a unit that is located at coordinates 0,0. Use the rose to give you an example and then mentally superimpose the rose over the location of the unit involved to get directions for bearings from that unit. Alternatively, you may wish to use a protractor. Laying one of these over the unit and aligning its 0 point perpendicular to the top of the map will give exact bearing locations from the unit.

3.2 THE PLAYING PIECES: The playing pieces are the die cut counters. They should be broken free from the frame and into individual pieces. Then the orange player should take the orange pieces while the blue player takes the blue pieces. Note that both players now have two sets of pieces in their color lettered A-J. They should give one set of these to the other player to be used to indicate locations for opposing units. The white pieces are markers for use by both players. There are two types, bearing markers and crossed bearing markers. The bearing markers indicate if they are noise level [from sonar search] or radar [from radar/visual search] and

have an arrow. When a player gets a search result indicating a bearing one of these makers can be placed on top of the unit which obtained the result with the arrow pointing in the direction of the bearing. When two or more of these bearing cross at some part of the map, this can be marked with one of the crossed bearing markers to indicate the possible location of an opposing unit. Often a single searching unit will produce a number of bearings. In this instance it is often simpler to place the bearing markers around the edge of the map down that bearing with the arrow pointed back toward the unit that obtained the bearing.

4.0 GETTING STARTED:

4.1 BOOTING: To boot the game you must have the computer indicated by the label on the box. In addition, a minimum of 48K of RAM and a disk drive are required. Simply place the disk in the drive and turn on the computer, or turn on the computer and type the boot code, or turn on the computer and type 'RUN FAST'. It is possible that your computer may run on a different DOS than that in which the program is written. In a case where normal boot up as above does not work, consult your DOS manual for how to boot up via your DOS conversion system.

4.2 NEW OR SAVED GAME: After booting the program will ask you if you wish to start a new game or restart a saved game. Give an 'N' or 'S' as required. 'S' will take you to the save game routine (see rule 9.0).

4.3 ONE OR TWO PLAYERS & PASSWORDS: When starting a game the computer will need to know how many people will play. By selecting 'O' for one, your opponent will be Crazy Ivan. Crazy Ivan is the computer and he always plays Orange. You will likely find Ivan more sly than crazy. Next the players will be asked to select a secret password. Simply pick a few letters and type them in. This password will be requested by the computer at the start of each player's segment so that only the correct player can play the segment. When playing against Crazy Ivan passwords are not required.

4.4 SCENARIOS: There are 7 prebuilt scenarios included in the game and detailed in rule 11.0. If you wish to play one of these simply indicate its number and the computer will set it up. Alternatively players may construct their own scenarios. If you select the Build Your Own option you will be asked a series of questions involved in setting up the scenario. These will include picking the environmental conditions (day or night; layer strength which effects sonar detection between different water depths; biologic intensity representing living creatures that make noise and which effect all sonar results), the nationalities each player will play, and the specific types of units each player will have. When playing against Crazy Ivan, the player will have to make these unit selections for Crazy Ivan also.

4.5 UNIT SELECTION RESTRICTIONS: In Build Your Own scenarios each player will have the option of selecting up to 7 surface ships or 3 submarines. If a player picks less than 7 surface ships he will have the option of having a submarine also. However the total number of units for both Orange and Blue may not exceed ten, so the players should decide in advance about how many units each will have. Victory point values as listed in the Unit data and the handicap system detailed under the Victory rules should be considered in these choices. If Soviet surface forces are picked the player will have the option of having patrol aircraft or a land based bomber strike. U.S., English, and French forces will have the option of a patrol craft. If a player has included an aircraft carrier he will have the option of a ready airstrike. Patrol aircraft and airstrikes are cancelled if the opposing player picks only submarine type units.

4.6 STARTING POSITIONS: Finally the players will be asked to give their starting locations for Build Your Own scenarios. Orange forces may enter start coordinates anywhere in a band starting at the map edges and extending into the map to a square 70000 yards from the map center. Blue forces may start anywhere in a box extending 50000 yards out from the center of the map. The computer will set initial courses and speeds.

4.7 UNIT & CONTACT DESIGNATIONS: Each player's units are assigned an individual number starting with 1. Units detected by search will be given a contact identification

letter. Each contact will have a unique letter and contacts on opposing units will have their letter displayed in inverse lettering.

4.8 ENTERING INFORMATION: In casual play the computer detects the completion of each information entry by the player pressing the return or entry key. 'Y' & 'N' are responses for Yes & No questions while digits are used for number responses. If just an entry is indicated the computer will assume that no change from the previous state is required. In timed play the computer will not require an entry indicator. Just a 'Y' or 'N' or number will enter the data. However responses requiring multiple keystrokes (course, speed, etc.) will still require a return or enter at the conclusion of the entry. Note that all entries should be made in upper case.

4.9 ABBREVIATIONS: The following are used in the text and program: MM [millimeter], IN [inch], YDS [yards], KYD [1000 yards], NMI [nautical mile], RNG [range], CSE [course], BRG [bearing], SAM [surface to air missile], ECM [electronic counter measures], HELO [helicopter], AAW [anti aircraft warfare], ASW [anti submarine warfare], GP [general purpose]. Units are abbreviated as follows: FF & FG [frigate], DD & DG [destroyer], CG & CGN [cruiser], BG & BGN [battleship], CH [helicopter carrier], CV & CVN [aircraft carrier], SS & SSN [attack submarine], SG & SGN [missile submarine], SB & SBN [ballistic missile submarine], AU [auxiliary], MR [merchant]. Note that a 'G' in these designations indicates the unit carries guided missiles and an 'N' indicates it is nuclear propelled.

5.0 THE SEARCH SEGMENT: The search segment is conducted by the computer. While it is going on the computer will display the turn and environmental conditions, as well as indicate which search is underway. Radar search will automatically be conducted for each ship or surfaced submarine whose radar has been ordered to the 'ON' mode. Radar search results are affected by the radar value of the searching unit, the ECM of opposing units, & by inclement weather. Results of radar searches by surface warships and surfaced Echo II type submarines will automatically be transmitted to all friendly units of those types. Visual search will automatically be conducted for surface ships and for submarines on the surface or at periscope depth. Visual search results can be degraded by night and inclement weather. Sonar search will automatically be conducted by all units with sonars. Search may be either active (sending a signal into the water) or passive (listening for noise in the water), depending on the ordered mode. Weather, biologics, acoustic layer, sonar capability, & opposing unit noise levels will affect sonar search.

6.0 THE PLAYER SEGMENTS:

6.1 GENERAL: Each player's opportunity to examine the results of the search segment and give orders to each of their units occurs during the player segments. Each player has an identical segment. The Orange Player will always have the first player segment; however all orders are resolved as if the player segments had occurred simultaneously. To start a player segment the player will have to tell the computer the proper password. Then a listing of options called a menu will be presented along with the question "YOUR SELECTION?". By typing the number of the desired selection you will go to that portion of the player segment. For all selections on the menu except 6 [Helo Movement] and 0 [End Segment] you will next be asked for which unit you wish the selection to apply. The computer will have automatically numbered your units sequentially from 1. Typing a number will take you to your selection for that particular unit. Each of these selections is detailed below.

6.2 RADAR/VISUAL CONTACTS: This selection will display the contact letter, range, bearing, and location of all units which the selected friendly unit detected in the previous search segment either visually, with radar, or by ECM. Bearings (only) to intercepted enemy radar emissions will also be displayed. The accuracy of such bearings is variable and false reports are possible. The current mode of the radar for that unit will be displayed and the player will be asked if a change in this mode (on or off) for the next turn is desired.

6.3 SONAR CONTACTS: Active sonar consists of the emission of acoustic signals from the searching unit.

Passive sonar consists of the searching unit listening for waterborne noise emitted from other units. If using active sonar, this selection will display the contact letter, range, bearing, and location of all units which the selected friendly unit detected in the previous search segment. If using passive sonar the contact letter, bearing, type of unit, and sonar mode of the detected unit [if it is active] will be displayed. In addition, bearings to detected noise levels will also be displayed. Noise levels represent small amounts of waterborne sound that may be heard but are too faint to be a contact. The accuracy of such bearings is variable and false bearings are possible. The current mode of the sonar for that unit will be displayed and the player will be asked if a change in this mode [active or passive] for the next turn is desired.

6.4 WEAPONS STATUS: This selection will display the weapons available to the selected unit, how many of each weapon remain available, the minimum range of the weapon [in 1000's of yards], and the maximum range of the weapon [also in 1000's of yards]. For submarines the status of torpedo tubes will be shown and the player will be allowed to change this status. Up to 2 changes may be made per turn with each loading of a tube or unloading of a tube counted as a change. Players not familiar with the weapons listed should consult the Ship & Weapon Information section [Rule 12.0].

6.5 FIRE CONTROL STATUS: This selection will display information available about any contacts being tracked by the selected unit's fire control system. The player will always be asked if tracking of a contact should begin. A yes response will lead the computer to display the contacts detected for tracking and ask which on contact to initiate tracking. Respond with the contact letter desired. Opposing contact letters will be displayed in inverse lettering. Different units will be able to track different numbers of contacts at the same time. If a fire control system is at its maximum and the player tries to track another contact the player will be given the option to drop tracking one of the current contacts to make room for the new contact. Players will always be given the option to fire weapons from the selected unit in this selection. The unit may conduct up to 2 attacks per turn with the following special restrictions:

A. Submarines at speeds greater than 15 knots or at extreme depth may not conduct attacks, while submarines below shallow depth may only attack with torpedos. These weapons will indicate when they cannot be fired.

B. Guns and various other weapons may only be fired at targets for which a precise range is known. These weapons will indicate if they cannot be fired.

C. Tracking a contact for 2 consecutive turns by radar, visual, or active sonar search, or 3 consecutive turns by passive sonar, will result in a fire control solution. This is indicated by a flashing contact letter. Fire control solutions produce the best combat results when firing weapons, but the player may launch weapons against any contact, even if a fire control solution is not ready. Such an attack is termed a Snapshot and will not have as great a chance of success. Snapshots may hit unintended units, friendly or opposing, that lie along the track of the weapon to its intended target.

6.6 CONNING ORDERS: This selection will display the selected unit's current position, course, speed, and, if applicable, depth. It will also display the capabilities and current orders for the unit. The player will be given the option of changing the unit's conning orders for the turn. Maximum speeds of units will be altered to reflect the scenario weather conditions. Submarines will be limited to a maximum speed of 15 knots when on the surface and 10 knots when at periscope depth.

6.7 HELO MOVEMENT: This selection will allow the player to review the status of available helicopters and give them orders. The number of helos available is a function of the units in the scenario and a modifying factor to account for maintenance. None will be available in stormy weather. The display will indicate the the location of the player's helos by their coordinates if they are airborne or by unit number if they are landed on a ship. Helos may fly for a maximum of 10 turns before running out of fuel and will be indicated by a flashing fuel status on its last possible airborne turn. Turns of flight remaining are indicated

for each helo after 'F' on the display. Giving a 'Land' order will automatically land the helo on a ship indicated by the player after the landing order. A 'Transit' order will let the player indicate the location to which the helo should move (example: X:10000 Y:20000) and will move the helo up to 30000 yards per turn to reach the assigned location. When on station the helo will hover at that location until ordered otherwise. Helos may sight opposing surface ships while in transit or on station but may only search for submarines when indicated as OnStation. In optimal conditions [daylight and calm] an enemy surface ship could be sighted up to 30000 yards distant and a submarine up to 5000 yards distant. Submarines that have fired missiles during the turn may be detected at greater ranges. Helos will automatically report sightings. If the sighting is a submarine the helo will automatically move to the location and attack. A helo can conduct 2 attacks before running out of weapons. The number of attacks still possible is indicated after the 'W' for the helo. A helo which lands will automatically spend 10 turns refueling and rearming before again becoming available for orders.

6.8 END SEGMENT: This selection will end the player segment. The player will be given a chance to reconsider and return to the main menu. When both players have completed their End Segments, play will move to the Combat Segment.

7.0 THE COMBAT SEGMENT:

7.1 GENERAL: During the Combat Segment all ordered and arriving attacks will be resolved by the computer. Next units will be moved as ordered during the previous Player Segments and any airstrikes will be resolved. Finally, helicopters will be moved, search resolved, and any possible attacks conducted.

7.2 ATTACK RESOLUTION: When resolving attacks the computer will display the weapon involved and the result of the attack. Torpedo attacks will only be announced when the attack is detected by the target unit. Such attacks may be detected a number of turns before the torpedos arrive, thus allowing time for evasive actions. Gun and missile attacks will be resolved in the same turn they are initiated. If the target in such an attack has its radar on it will automatically try to electronically jam and shoot down incoming missiles. The direction from which an attacking weapon is approaching will often be displayed. Damage is determined for each hit based on the warhead of the weapon and the general location of the hit. Damage will cause decreases in various unit abilities. With enough damage a unit may be gutted [100 percent damage] or sunk outright.

7.3 MOVEMENT & AIRSTRIKES: Movement will occur automatically in accord with current conning orders and taking into account any damage sustained during the turn. Units exiting the map will be indicated and permanently leave the game. The Blue player receives bonus victory points in all scenarios for exiting aircraft carriers, merchants, amphibs, and auxiliaries. Next any patrol aircraft or airstrikes scheduled to arrive during the turn will do so. Defending forces will automatically fire on attacking air units when possible. Surviving strike aircraft will then launch attacks. Air combat results are strongly influenced by environmental conditions. Patrol aircraft will loiter in the area to automatically assist in future searches.

7.4 HELICOPTER ACTIONS: Following air combat helos will transit as ordered, automatically conduct search, and transmit any results. Helos detecting submarines and having remaining weapons will automatically conduct attacks, which will be resolved immediately. Helos are subject to being shot down by opposing forces.

8.0 ENDING OR SAVING THE GAME & VICTORY:

8.1 ENDING OR SAVING THE GAME: At the end of each turn you will be given the option to end or save the game. If you choose to end the game permanently the base victory point total for each player will be calculated and displayed. You will then have the option of reviewing the final status of all units involved in the game by responding 'Y' to the review question. If you decide to save the game you must have available another disk that has previously been initialized. The computer will prompt you through the saving routine. The save program uses the same drive as the program disk. Remove the

program disk and insert an initialized save disk. CAUTION! There is not enough room on the game disk to save games in progress. Do not attempt to do so. A spare initialized disk can be used to hold at least 20 in progress games. Be sure to use one. After saving a game the computer can be shut down or play may be continued on the next turn of the game just saved and still in progress.

8.2 VICTORY: The player earning the most victory points at the end of the game is the winner. The computer automatically calculates the base victory point levels. The players must manually calculate and add in any handicap points required. The computer awards base victory points for the following: damage & destruction of opposing units [variable with damage up to the value of the unit], exiting CVs, AUs & MRs [Blue player only] [variable with damage], shooting down opposing aircraft [10 points each]. The computer automatically subtracts base victory points for the following: accepting patrol aircraft or airstrikes [100 points], each use of a nuclear weapon [100 points], allowing a helo to run out of fuel [10 points]. The actual total displayed will be adjusted so that neither player has a negative value, but the spread of points between the players will not be altered. Handicap points for the scenarios provided with the game are listed in each individual scenario description. When producing your own scenarios, players should determine the handicap at the end of play based on the victory point values of the units picked by each player. Each player should total the point value of his units as listed in rules section 12.2. However AU and MR type units should have their victory point value subtracted from the owning player's total. Remember to include an extra 100 points in the total of a player having selected an airstrike. Determine the difference between these totals for each player and award that number of points as a handicap to the player with the lower total. This handicap is then added to the appropriate player's computer determined base victory point total to find the final levels. The player with the most points then wins, though any scores that are within 20 points when more than 2 units per side are in play, are so close they should be considered a draw. Note that when picking forces, one player's victory point total for his forces should not exceed twice that of the other player or the scenario will be impossible to correctly handicap.

9.0 NOTES ON PLAY:

9.1 BUILD YOUR OWN SCENARIOS: The players should agree ahead of time as to the general environmental conditions and force levels to be used. For this latter item some maximum number of victory point value in units should be agreed to. However specific units picked should be up to each player and should not be revealed to the opposing player. In making your choices, consider the following guidelines.

Submarines can be the most dangerous units in the game due to their difficulty to detect and their powerful weapons, but they are often limited to passive sonar search. Submarines are further limited by their fragility and will be sunk by almost any hit.

Surface ships have a number of search systems that can provide rapid fire control solutions, but many are only designed for one main task [anti submarine, anti air, or anti surface] and surface ships are often easily detected. Try to mix your choice of forces to provide coverage in all areas. Those familiar with the ship classes in the game will not have difficulties doing this, but if you do not have this background consult the Ship & Weapon Information section of the rules for general classifications. Aircraft carriers and other high value units such as BGs provide great abilities [air strike and many helos from carriers, large numbers of heavy weapons from BGs] but the damage or loss of such a unit can easily give the opposing player an overwhelming lead in victory points.

The initial locations of forces can greatly affect a scenario. The Blue player must consider that units placed to the west are less likely to run into opposing units quickly, but that any high value units will not be able to exit the east edge for bonus victory points for some time. Placing to the east makes exit quicker but can prevent any time for maneuver and escape before

weapons begin to fly if the Orange player has tried to block an eastern exit. The center is a good compromise for Blue placement, but it is also the most predictable for Orange. The Orange player must consider the above in initial placement, as well as the advantages of doing the unexpected. Placement to the north, south, and/or west can lead to a headstart for Blue, but will also lead to positional uncertainty and stretch Blue search resources.

The selected environmental conditions can have a great impact on play. At night visual ranges are greatly reduced and periscope observations nearly useless. Less capable aircraft are severely restricted. Weather conditions impact not only visual ranges, but also radar and sonar search, weapons use, and aircraft effectiveness. Sonar conditions, such as biologics and layer, can cut down on the search abilities of both submarines and anti submarine forces. Keep these factors in mind when making your selections.

9.2 SUBMARINE TACTICS: Unless there is somewhere to go, submarines should move slowly. This will maximize the effectiveness of their passive sonar while decreasing the noise levels they emit. Approaches on opposing units should be made at depth and bow on to decrease the chance of being detected. The submarine commander must develop a sense of when to be patient while awaiting a fire control solution and when to drop a snapshot and run. Try to keep at least 10000 yards from opposing surface ships since most have limited range ASW weapons. When attacked, shoot back if possible, and run away deep and fast.

9.3 SURFACE SHIP TACTICS: Surface ships must work together as teams to deter opposing forces. They should employ speed to their advantage. Use good ASW ships as screens on the flanks of high value units. Place good AAW ships near your high value units. Put units with heavy, long range weapons in the center of formations. Move forward less capable units that can be used to detect opposing units. Use helos whenever possible to find opposing units, both submarines and surface forces. When attacking submarines, move rapidly to the location, slow and go active, and attack as quickly as possible. But keep someone back for exploiting counterattacks. When engaging surface forces, try to do so from outside their weapons ranges, though this is often difficult.

9.4 MISSILE COMBAT: The main decisions in missile combat involve when to launch and how many weapons to use. There is an axiom that states "He who shoots first, wins". Though there is an element of truth to this, snapshots should not be used exclusively. The number of missiles carried is often limited and snapshots have greatly reduced chances of finding their targets. In addition, high capability units will be able to jam or shoot down many incoming weapons, so large salvos are often required to saturate their defences. Keep in mind that most of the above also applies to the use of torpedos. Note that some units have SAMs listed among their weapons. These can be used against surface ships since they have some level of dual purpose ability. However, they are not very good at anti surface attacks and those used against surface vessels will not be available for use against opposing missiles and aircraft.

9.5 NUCLEAR WEAPONS: Nuclear warhead weapons are indicated by an asterisk. They are not for general use and should only be fired against high value units or a threat that is about to cause extreme damage. Note that nuclear detonations can cause damage beyond 3000 yards from their impact point and that helos are especially fragile.

9.6 RADAR SEARCH: Using radar prematurely can give your opponent vital information as to your direction. However, with radar off a ship is very vulnerable to missile and aircraft attack. Once you suspect that your location is known, there is very little reason to keep radars off. Note that a radar detection from one ship or helo will be transmitted to all ships of that side, even if those other ships do not have their radars on.

9.7 ACTIVE SONAR SEARCH: Active sonar can also give away the location of the unit, but it provides the range information which is required for many weapons. Factors that modify active sonar effectiveness are: the active sonar ability of the unit, the speed of the unit, weather, the acoustic layer, the aspect of units to be detected, and if the contact is currently being tracked by fire control. As a general rule the active sonar of

surface ships is better than their passive sonar while the opposite is true for submarines. There are exceptions to this rule.

9.8 PASSIVE SONAR SEARCH: Passive sonar can never give an indication of the unit's position to opposing units, however it cannot provide range information for most units prior to establishing a fire control solution, though some very capable units may obtain approximate ranges. And it takes longer to produce that solution. Factors modifying effectiveness are: the passive sonar ability of the unit, the inherent noise levels of the unit and its contacts, the speed of the unit and its contacts, the use of active sonar by the contact or other nearby units, the presence and strength of an acoustic layer between the unit and the contact, the level of biologics present, and if the contact is currently being tracked by fire control. Units with exceptional passive sonar ability may detect contacts in the "convergence zone" far beyond their normal range ability. Additionally, such units may obtain approximate ranges to a contact due to a method known as "multi-pathing". Both of these operations occur automatically.

9.9 BAFFLES, BIOLOGICS & THE LAYER: Neither active or passive sonar can detect units which are in the searching unit's baffles. This is an area within 30 degrees of either side of the searching unit's stern. Biologics are the background noise of the sea caused by various life forms such as fish, prawns, etc. The presence of biologics will generally reduce the passive sonar range of all units. The layer is an acoustic boundary formed due to water temperature differences. It exists between, and defines the boundary of, the shallow and deep depths. This layer will degrade both active and passive sonar search conducted through it.

10.0 PREBUILT SCENARIOS: The following prebuilt scenarios depict a number of potential combat situations. When one is used the computer will assign the units for each player, determine the environmental conditions, and place the units. When playing against the computer, Crazy Ivan will be the Orange player. Since all scenarios were constructed to realistic force levels, rather than as balanced situations, a handicap will be listed.

10.1 THE KURIL ISLANDS: The Soviet Union has declared the Sea of Okhotsk to be an "inland sea". Japan sends forces to challenge this sovereignty declaration. Japan is Blue and has 3 surface ships. The USSR is Orange and has 3 submarines. Blue has a 75 point handicap.

10.2 THE INDIAN OCEAN: Increasingly unhappy with major power forces in the Indian Ocean, India attempts to make a show of force against the French in the Bay of Bengal. French national pride will not allow compromise and the situation deteriorates to conflict. France is Blue with 4 surface ships, including a CV. India is Orange with 3 surface ships and 1 submarine. Orange has a 150 point handicap.

10.3 THE BALTIC SEA: War has broken out in Europe and the Twice Honored Red Banner Baltic Fleet is attempting to move an amphibious group under cover of darkness for a dawn landing. The USSR is Blue with 3 surface ships, 2 amphibians, and 2 AUs. Germany is Orange with 2 surface ships, 1 submarine, and a land based airstrike on the way. Blue has a 275 point handicap.

10.4 THE NORWEGIAN SEA: After war breaks out the US sends a battle group into northern waters to guard Norway's flank. Meanwhile a group from the Soviet Northern Red Banner Fleet has broken past the submarine cordon off North Cape and is heading for the merchant shipping lanes of the Atlantic. The US is Blue with 6 surface ships, including a CV. The USSR is Orange with 4 surface ships including a CV and the option of a land based air strike. Orange has a 200 point handicap if it uses the air strike and a 300 point handicap if it does not.

10.5 THE WESTERN PACIFIC: A few days into a global conflict a head to head engagement occurs between two surface action groups as the US deploys Westpac and the Soviets move out of Da Nang. The US is Blue with 5 surface ships. The USSR is Orange with 4 surface ships and 1 submarine. Blue has a 25 point handicap.

10.6 THE MEDITERRANEAN SEA: In conjunction with a general war in Europe, the Soviet naval squadron in the Med has been given orders to neutralize all US forces in their area. A submarine group is vectored to intercept a

carrier group as it leaves Naples. The US is Blue with 1 submarine and 6 surface ships, including a CV. The USSR is Orange with 3 submarines. Orange has a 75 point handicap.

10:7 THE SOUTH ATLANTIC: On 1 May 1982 the Argentine CV Vienticinco de Mayo was part of a 3 pronged attack on the English task group near the Falkland Islands. This scenario explores the situation that might have occurred if the northern Argentinian task group had not been turned back by bad weather. England is Blue with 4 surface ships (including the Invincible) and 1 AU. Argentina is Orange with 4 surface ships and an air strike from the de Mayo that is out of the area. England has a 150 point handicap.

11.0 DESIGNER'S NOTES: The subject of limited intelligence has always stimulated debate among wargamers. The traditional media of manual wargames has never been able to completely simulate the "fog of war" that is often the major factor in operational outcomes. Naval games, and in particular those involving submarines, are especially affected by this limitation.

GREY SEAS, GREY SKIES was first conceived in 1975 while I was under training to become a submarine officer. At that time home computers were rather uncommon and the only game of any significance on modern naval warfare was Stephen Newberg's SSN. Aside from suffering from the problems described above, the game also utilized many simplifications for the sake of playability and clearing security regulations. The computer and no longer being in the service have offered solutions to the above difficulties.

In **GS,GS** the players are placed in the role of the tactical control or commanding officer of each of their units. Each player must also coordinate the individual actions of units toward a common goal, and thus also acts as the task group commander when groups of units are used. The details of driving ships, flying helicopters, generating fire control solutions, etc. are left to the crew and equipment of the units as represented by the computer program. Similarly, the strategic aspects of naval warfare are outside the scope of the game. Thus task force functions that occur 100 or more miles from the group, such as long range ASW, major airstrikes, and distant Combat Air Patrol are not represented. For the prebuilt scenarios these items have been built in by affecting the units available. When building scenarios, players should keep these factors in mind when determining the force levels present.

The Timed Play option should not be attempted until the players are comfortable with the game system. The timer is included to create some of the pressures of actual combat; hopefully a captain would not be asked to go into combat without having first had a chance to become familiar with his ship. The amount of time available when using the timer is intentionally independent of the number of units being controlled so as to, in part, simulate the difficulties of a task group commander in coordinating the actions of many units.

The ships and submarines represented in the game were selected from the typical forces which would be available from the 1970s through the 1990s. NAUTILUS, the First and Finest atomic submarine, was included for sentimental reasons.

I must now give credit to those who, in many diverse ways, aided in the growth of **GS,GS**. Chuck Wofford, Charles Kassel, David Bahl, and Chris Molteni in combination devoted hundreds of hours to play testing and provided many suggestions for improvements, not all of which I agreed to. Stephen Newberg not only provided the original inspiration for the game, but also made numerous suggestions for developmental changes and improvements [all of which I agreed to]. Finally, I must acknowledge the generosity of my wife, Karen, in providing what was at times undeserved understanding and patience.

W. J. Nichols

12.0 SHIP & WEAPON INFORMATION:

12.1 WEAPON INFORMATION: Following are a number of groupings of weapon types followed by the names of weapons that fit in each type.

ANTI SHIP MISSILES: SS-N-2C, SS-N-7, SS-N-12, SS-N-19, Harpoon, Tomahawk, Exocet, Otomat.

ASW MISSILES: Asroc, Ikara, Malefon.

ANTI SHIP & ASW MISSILES: Fras-1, SS-N-14, SS-N-15, SS-N-16, Subroc, Nuclear Asroc.

AAW MISSILES: SA-N-3, SA-N-6, SM-1-MR, SM-1-ER, SM-2, Sea Dart.

ASW TORPEDOS: Mk 46, L3, L5.

ASW & ANTI SHIP TORPEDOS: 533 MM, 400 MM, Mk 48, Tigerfish, Spearfish, F17, Seasnake, A-184.

ASW MORTARS: RBU-1000, RBU-6000, Limbo, ASW Mortar.

GUNS: 57MM, 76MM, 100MM, 114MM, 130MM, 5 IN, 16 IN.

12.2 SHIP INFORMATION: Following are a series of ship listings by country. The format will be: class name, unit type, victory point value, unit specialty (meaning the unit is oriented to either AAW, ASW, or GP use).

USSR: Soviet CV, CVN 250 GP. Kiev, CV 100 GP. Moskva, CH 80 ASW. Kirov, BGN 100 GP. Krasina, CG 70 GP. Kara, CG 50 ASW. Kresta II, CG 50 ASW. Kynda, CG 50 GP. Sovremenny, DG 50 GP. Udaloy, DG 50 ASW. Keshin, DG 30 GP. Krivak II, FG 20 GP. Oscar, SGN 200 GP. Charlie I, SGN 80 GP. Echo II, SGN 50 GP. Alpha, SSN 100 ASW. Victor II, SSN 70 GP. November, SSN 50 GP. Yankee, SSN 50 GP. Sierra, SBN 300 -. Delta III, SBN 200 -. Tango, SS 40 GP. Foxtrot, SS 30 GP.

USA: Nimitz, CVN 250 GP. New Jersey, BG 100 GP. Ticonderoga, CG 70 GP. Virginia, CGN 50 GP. Belknap, CG 50 AAW. Leahy, CG 50 AAW. Burke, DG 50 GP. Spruance, DD 50 ASW. Adams, DG 40 GP. O.H.Perry, FG 30 ASW. Knox, FF 30 ASW. SSN(X), SSN 80 GP. Los Angeles, SSN 100 ASW. Sturgeon, SSN 80 ASW. Permit, SSN 70 GP. Skipjack, SSN 50 GP. Ethan Allen, SSN 50 GP. Nautilus, SSN 40 GP. Ohio, SBN 300 -. Lafayette, SBN 200 -.

UK: Invincible, CH 100 ASW. Sheffield, DG 30 AAW. Type 24, DG 30 GP. Broadsword, FG 30 GP. Amazon, FG 20 GP. Leander, FF 20 ASW. Trafalgar, SSN 80 ASW. Swiftsure, SSN 70 GP. Resolution, SBN 200 -. Upholder, SS 40 ASW. Oberon, SS 30 GP.

FR: Clemenceau, CV 150 GP. C-70 AA, DG 30 AAW. G. Leygues, DG 30 GP. Tourville, DG 30 ASW. D'Orves, FG 10 ASW. C. Riviere, FF 20 ASW. Rubis, SSN 70 GP. Agosta, SS 40 GP. Daphne, SS 30 GP. Redoubtable, SBN 200 -.

OTHERS: Bremen, FG 30 GP. U-13, SS 40 GP. Lupo, FG 20 GP. Maestrale, FG 30 ASW. N. Sauro, SS 40 GP. Shirane, DG 30 ASW. Hatsuyuki, DG 20 GP. Yushio, SS 40 GP. Luta, DG 20 GP. Jianghu, FG 10 GP. Romeo, SS 30 GP. Godavari, FG 20 GP. Auxiliary, AU 70 -. Merchant, MR 50 -.

GREY SEAS, GREY SKIES, A Computer Game Of Modern Naval Combat.

The world of the modern naval officer has become very complex. A captain no longer stands on his bridge to view the approach of his enemies and see the effects of his fire. The men that command modern ships do so from deep inside the hull in a room where all the electronic systems that detect, track, and attack come together, the Combat Information Center. GS,GS puts you in that room.

GREY SEAS, GREY SKIES is THE representation of modern naval combat at the tactical level. It covers submarines, surface ships, and aircraft in a highly realistic and accurate manner. Your computer takes the place of the electronic equipment of up to ten ships and submarines in a 10,000 square mile section of ocean. A number of pre-set scenarios are included, as well as the option for players to create their own scenarios from the naval units of any of the world's major powers. Also included are 2 maps and playing pieces for use in producing manual tracking when search results are insufficient for a computer derived solution. Play may be with two players or against the computer. The game was designed by W. Nichols, with art by J. Kula.

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Board Games:

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 SEAPOWER & THE STATE, World War III At Sea. A Strategic Study.
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 LA REGIA MARINA, The Battle For The Mediterranean, 1940-1943. A Complex Strategic Study
 DIVINE WIND, Japan In The Pacific, 1941-1945. A Complex Strategic Study.
 KRIEGSMARINE, Naval Combat Against The Axis. A Tactical Game.
 I.J.N., Naval Combat Against Japan. A Tactical Game.
 ORTONA, The Advance Through Italy, Dec. 1943. An Operational Game.
 ASSAULT ON TOBRUK, Rommel Triumphant, 20 June, 1942. An Operational Game.
 DIEPPE, The Return To The Continent, 19 Aug., 1942. An Operational Game.
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 HANNIBAL, The Italian Campaign, 218-206 BC. A Strategic Study.
 WARRING STATES, The Unification Of China, 231-221 BC. A Strategic Game.
 THE PELOPONNESIAN WAR, Athens Versus Sparta. A Strategic Study.

Computer Games:

GREY SEAS, GREY SKIES, Modern Naval Combat. A Tactical Study.
 FALL GELB, The Fall of France, Spring, 1940. A Strategic Study.

A NOTE ON COMPLEXITY: Those described as Games are fairly easy. Studies are of medium complexity. Complex Studies are just that.